APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,121	08/28/2003	Olvi L. Mangasarian	1061-001US01	5513

28863 7590 05/05/2006	EXAMINER
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| SUITE 105 | ART UNIT | PAPER NUMBER |
| ST. PAUL, MN 55125 | 2129 | |

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/650,121	MANGASARIAN ET AL.
	Examiner	Art Unit
	Mai T. Tran	2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 February 2006*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-57* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

REMARKS

Applicants' amendment dated February 1, 2006 responding to the November 1, 2005

Office Action provided in the rejection of claims 1-45, wherein claims 7, 22, and 37 have been

amended and claims 46-57 are newly added. Claims 1-57 remain pending in the application and

which have been fully considered by the examiner.

CLAIM REJECTIONS - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The invention as disclosed in claims **1-57** is directed to non-statutory subject matter.

2.   None of them is limited to practical applications. Examiner finds that *In re Warmerdam*,

33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) controls the 35 U.S.C. § 101 issues on

that point for reasons made clear by the Federal Circuit in *AT&T Corp. v. Excel*

Communications, Inc., 50 USPQ2d 1447 (Fed. Cir. 1999). Specially, the Federal Circuit

held that the act of:

> ...[T]aking several abstract ideas and manipulating them together adds nothing to the basic equation. *AT&T v. Excel* at 1453 quoting *In re Warmerdam*, 33 F.3d 1354, 1360 (Fed. Cir. 1994).

Examiner finds that Applicants' "a linear programming formulation of a support vector

machine classifier" references are just such abstract ideas.

3.   Examiner bases his position upon guidance provided by the Federal Circuit in *In re Warmerdam*, as interpreted by AT&T v. Excel. This set of precedents is within the same line of cases as the *Alappat-State Street Bank* decisions and is in complete agreement with those decisions. *Warmerdam* is consistent with *State Street 's* holding that:

> Today we hold that *the transformation of data, representing <u>discrete dollar amounts</u>, by a machine through a series of mathematical calculations into a final share price*, constitutes a practical application of a mathematical algorithm, formula, or calculation because it produces 'a useful, concrete and tangible result" -- *a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades*. (emphasis added) *State Street Bank* at 1601.

4.   True enough, that case later eliminated the "business method exception" in order to show that business methods were not per se nonstatutory, but the court clearly *did not* go so far as to make business methods *per se statutory*. A plain reading of the excerpt above shows that the Court was *very specific* in its definition of the new *practical application*. It would have been much easier for the court to say that "business methods were per se statutory" than it was to define the practical application in the case as "...the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price..."

5.   The court was being very specific.

6.   Additionally, the court was also careful to specify that the "useful, concrete and tangible result" it found was "a final share price momentarily fixed for recording purposes and even accepted and <u>relied upon</u> by regulatory authorities and in subsequent <u>trades</u>." (i.e. the trading activity is the <u>further practical use</u> of the real world <u>monetary</u> data beyond the transformation in the computer – i.e., "post-processing activity").

7.   Applicants cite no such specific results to define a useful, concrete and tangible result.

Neither do Applicants specify the associated practical application with the kind of

specificity the Federal Circuit used.

8.   Furthermore, in the case *In re Warmerdam*, the Federal Circuit held that:

> ...[T]he dispositive issue for assessing compliance with Section 101 in this case is whether the
> claim is for a process that goes beyond simply manipulating 'abstract ideas' or 'natural
> phenomena' ... As the Supreme Court has made clear, '[a]n idea of itself is not patentable, ...
> *taking several abstract ideas and manipulating them together adds nothing to the basic*
> *equation*. In re Warmerdam 31 USPQ2d at 1759 (emphasis added).

9.   Since the Federal Circuit held in in *Warmerdam* that this is the "dispositive issue" when

it judged the usefulness, concreteness, and tangibility of the claim limitations in that case,

Examiner in the present case views this holding as the dispositive issue for determining

whether a claim is "useful, concrete, and tangible" in similar cases. Accordingly, the

Examiner finds that Applicants manipulated a set of abstract "a linear programming

formulation" to solve purely algorithmic problems in the abstract (i.e. what *kind* of

"programming formulation" is used? algorithm elements?) Clearly, a claim for

manipulation of "linear programming formulation" is provably even more abstract (and

thereby less limited in practical application) than pure "mathematical algorithms" which

the Supreme Court has held are per se nonstatutory – in fact, it *includes* the expression of

nonstatutory mathematical algorithms.

10.   Since the claims are not limited to exclude such abstractions, the broadest reasonable

interpretation of the claim limitations includes such abstractions. Therefore, the claims

are impermissibly abstract under 35 U.S.C. §101 doctrine.

11.   Since *Warmerdam* is within the *Alappat-State Street Bank* line of cases, it takes the same

view of "useful, concrete, and tangible" the Federal Circuit applied in *State Street Bank*.

Therefore, under *State Street Bank*, this could not be a "useful, concrete and tangible

result". There is only manipulation of abstract ideas.

12.   The Federal Circuit validated the use of *Warmerdam* in its more recent *AT&T Corp. v.*

Excel Communications, Inc. decision. The Court reminded us that:

> Finally, **the decision in In re Warmerdam**, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994)
> **is not to the contrary.** *** The court found that the claimed process did nothing more than
> manipulate basic mathematical constructs and <u>concluded that 'taking several abstract ideas</u>
> <u>and manipulating them together adds nothing to the basic equation'</u>; hence, the court held
> that the claims were properly rejected under §101 ... Whether one agrees with the court's
> conclusion on the facts, <u>the holding of the case is a straightforward application of the basic</u>
> <u>principle that mere laws of nature, natural phenomena, and abstract ideas are not within the</u>
> <u>categories of inventions or discoveries that may be patented under §101.</u> (emphasis added)
> AT&T Corp. v. Excel Communications, Inc., 50 USPQ2d 1447, 1453 (Fed. Cir. 1999).

13.   Remember that in *In re Warmerdam*, the Court said that this was <u>the dispositive issue</u> to

be considered. In the *AT&T* decision cited above, the Court <u>reaffirms</u> that this is the issue

for assessing the "useful, concrete, and tangible" nature of a set of claims under 101

doctrine. Accordingly, Examiner views the *Warmerdam* holding as the dispositive issue

in this analogous case.

14.   The fact that the invention is merely the manipulation of *abstract ideas* is clear. The data

referred to by Applicants' phrase "linear programming formulation" is simply an abstract

construct that does not limit the claims to the transformation of real world data (such as

monetary data or heart rhythm data) by some disclosed process. Consequently, the

necessary conclusion under *AT&T, State Street* and *Warmerdam,* is straightforward and

clear. The claims take several abstract ideas (i.e., "computing elements" in the abstract)

and manipulate them together adding nothing to the basic equation. Claims 1-57 are,

thereby, rejected under 35 U.S.C. §101.

CLAIM REJECTIONS - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-57 are rejected under 35 U.S.C. §112, first paragraph because current case law

(and accordingly, the MPEP) require such a rejection if a §101 rejection is given because

when Applicant has not in fact disclosed the practical application for the invention, as a

matter of law there is no way Applicant could have disclosed *how* to practice the

undisclosed practical application. This is how the MPEP puts it:

> ("The how to use prong of section 112 **incorporates as a matter of law** the requirement of 35 U.S.C. §101 that the specification disclose as a matter of fact a practical utility for the invention.... If the application fails as a matter of fact to satisfy 35 U.S.C. §101, then the application also fails as a matter of law to enable one of ordinary skill in the art to use the invention under 35 U.S.C. §112."); In re Kirk, 376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967) ("Necessarily, compliance with § 112 requires a description of how to use presently useful inventions, **otherwise an applicant would anomalously be required to teach how to use a useless invention.**") See, MPEP 2107.01(IV), quoting In re Kirk (emphasis added).

Therefore, claims 1-57 are rejected on this basis.

CLAIM REJECTIONS - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1-57** are rejected under 35 U.S.C. 102(b) as being anticipated by "Finite Newton

Method for Lagrangian Support Vector Machine Classification", by Glenn Fung et al, Data

Mining Institute Report, 02-01, February 2002, hereafter Fung.

Claim 1

A method comprising:

defining a linear programming formulation of a support vector machine classifier (page 3,

paragraph 2, line 9 – the linear and nonlinear kernel classification);

solving an exterior penalty function of a dual of the linear programming formulation to

produce a solution to the support vector machine classifier (page 5, equation (10)); and

selecting an input set for the support vector machine classifier based on the solution (page

5, line 25).

Claim 2

The method of claim 1, further comprising minimizing the exterior penalty function for a

finite value of a penalty parameter (page 2, line 5).

Claim 3

The method of claim 1, wherein the linear programming formulation is a 1-norm linear

programming formulation (page 4, line 1).

Claim 4

The method of claim 1, wherein the solution is a least 2-norm solution (page 4, line 3).

Claim 5

The method of claim 1, wherein the support vector machine classifier is a linear support

vector machine classifier, and selecting an input set includes selecting a set of input features of

the linear support vector machine classifier (page 3, line 16).

Claim 6

The method of claim 1, wherein the support vector machine classifier is a nonlinear

support vector machine classifier, and selecting an input set includes selecting a set of kernel

functions for the nonlinear support vector machine classifier (page 5, line 17).

Claim 7

The method of claim 1, further comprising:

calculating a separating surface based on the input set and the support vector machine

classifier (page 5, line 7); and

classifying data using the separating surface (page 5, lines 7-10).

Claim 8

The method of claim 7, further comprising classifying the data into two sets of data using

the separating surface (page 4, Figure 1).

Claim 9

The method of claim 7, wherein the separating surface is one of an n-dimensional

hyperplane or a nonlinear surface (page 3, line 12).

Claim 10

The method of claim 1, further comprising applying a Newton-based algorithm to solve

the exterior penalty function (page 7, equation (17)).

Claim 11

The method of claim 1, further comprising applying one or more linear constraints to the solution of the exterior penalty function (page 6, line 19).

Claim 12

The method of claim 1, wherein selecting an input set includes selecting a subset of input features from a larger set of input features that is substantially larger than the subset of input features (page 14, paragraph 5).

Claim 13

The method of claim 12, wherein the subset of input features includes less than approximately one percent of the larger set of input features (page 14, paragraph 5).

Claim 14

The method of claim 12, wherein the subset of input features includes less than approximately .1 percent of the larger set of input features (page 14, paragraph 5).

Claim 15

The method of claim 12, wherein the larger set of input features includes more than 20,000 input features, and the subset of input features includes less than ten input features (page 1, abstract).

Claim 46

The method of claim 1, further comprising applying the support vector machine classifier to classify data relating to one of fraud detection, credit evaluation, gene expression, intrusion detection, medical diagnosis or medical prognosis (page 13, paragraph 5.1, 5.1.1).

Claim 47

The method of claim 1, further comprising applying the support vector machine classifier

to classify data relating to multiple myeloma (page 13, paragraph 5.1).

Claim 48

The method of claim 1, further comprising applying the support vector machine classifier

to classify data relating to absolute call measurements for multiple myeloma (page 13, paragraph

5.1.1).

Claims 16-30 and 49-51, this is a system version of the claimed method discussed above, in

claims 1-15, wherein all claimed limitations have also been addressed and cited as set forth

above.

Claims 31-45 and 52-54, this is a software version of the claimed method discussed above, in

claims 1-15, wherein all claimed limitations have also been addressed and cited as set forth

above.

RESPONSE TO ARGUMENTS

Applicants' arguments filed February 1, 2006 have been fully considered but they are not

persuasive. Specifically, Applicants make the following arguments:

1.   **Rejection of claims 1-57 under 35 U.S.C. § 101 and 35 U.S.C. § 112, 1ST paragraph:**

- Argument 1: *With respect to the abstract idea basis, Applicants respectfully submit that the claimed invention clearly provides a useful, concrete and tangible result.*

The various claims are directed to a method, apparatus, and article of manufacture useful in data classification. Although the claimed invention may rely in part on mathematical relationships and computing techniques, it presents a substantial practical application of such relationships and techniques to data classification.

Regarding the "process" recitals in claims 1-15 and 46-48, the "system" claims in claims 16-30, 49-51, and 55-57, and the "product of manufacture" claims in claims 31-45 and 52-54, the invention is still found to be non-statutory. Any other finding would be at variance with current case law. Specifically, the Federal Circuit held in *AT&T v. Excel*, 50 USPQ2d 1447 (Fed. Cir. 1999) that:

> Whether stated implicitly or explicitly, we consider the scope of Section 101 to be the same regardless of the form -- machine or process -- in which a particular claim is drafted. AT&T v. Excel, 50 USPQ2d 1447, 1452 citing In re Alappat, 33 F.3d at 1581, 31 USPQ2d at 1589 (Rader, J., concurring) (emphasis added.)

Examiner considers the scope of Section 101 to be the same regardless of whether Applicants *claim* a "process", "machine", or "product of manufacture". While the "method" recitals in the preambles of claims 1-15 and 46-48 make the claims ostensibly drawn to be "process" claims, they are insufficient by themselves to limit the claims to statutory subject matter. Likewise, the attempts to limit claims 16-39, 49-51, and 55-57 to "system" claims, they are insufficient by themselves to limit the claims to statutory subject matter. Likewise, the attempts to limit claims 31-45, and 52-54 to "product of manufacture" claims are insufficient by themselves to limit the claims to statutory subject matter. Examiner's position is clearly consistent with *Alappat*, and *AT&T* and is implicitly consistent with *Warmerdam* and *State Street*. Accordingly, those claims are also properly rejected.

- Argument 2: *It seems undeniable that such subject matter provides a useful result, i.e. identification of different classes of data within a larger set of data. Data classification may be used in a wide variety of fields including, for example, data mining, medical diagnosis, medical prognosis, fraud detection, intrusion detection, credit evaluation and gene expression.*

  The result provided by the claimed invention is also concrete within the meaning of section 101. In particular, the data classification results are concrete in the sense they provide a repeatable, predictable result in classifying data into different classes. Accordingly, there should be no question that the claimed invention provides a concrete result.

  Finally, the claimed invention also provides a tangible result. Neither section 101 nor the case law require that, to be tangible, a claim to be tied to a particular machine or apparatus or operate to change articles or materials to a different state or thing. On the contrary, the result must be tangible in the sense that the claimed invention provides a practical application.

  The claimed invention does not simply manipulate abstract ideas. The fact that the claims recite the use of a linear programming formulation does not mean that the claims merely define an abstract idea. On the contrary, the linear programming formulation is one aspect of the claimed invention as a whole, which applies the linear programming formulation to produce a reduced input set for use by a support vector machine classifier in classifying data.

  In particular, the claims require selection of an input set for a support vector machine classifier based on a solution to an exterior penalty function of a dual of a linear programming formulation of the support vector machine classifier. The selection of an input set for a support vector machine classifier is not an abstract idea per se, nor merely a mathematical algorithm in the abstract.

- Argument 3: *As described in Applicant's disclosure, a support vector machine (SVM) classifier is a tool for data classification and is often used for data mining operations. To enhance performance of an SVM classifier, it is desirable to make the input set used to define the separating surface applied by the SVM classifier as small as possible. The input set for an SVM classifier may present thousands, or even millions, of data points. The claimed invention permits suppression of the input set to substantially enhance the performance of an SVM classifier.*

  Hence, identification of the particular type of data classified by the SVM classifier is not necessary to support a practical application. Rather, the practical application of the claimed invention is data classification itself. This is similar to an invention relating to data encryption, encoding or compression. In those cases, mathematical expressions are applied to encrypt, encode or compress data, without necessary regard to the particular nature of the data.

  The practical application of the claimed invention is data classification, much like the practical application of a data encryption process is encryption, without regard to the type of data that is encrypted. On a similar note, the practical application of a fluid handling device is fluid handling, regardless of the particular type of fluid that is

> *handled. To view the practical application in terms of the type of data that is classified misses this point.*
>
> *Applicant respectfully submits that the Office Action seems to place too much emphasis on the presence of a linear programming formulation in the claims, and overlooks the application of the linear programming formulation in reducing the input set for a support vector machine classifier to enhance data classification performance. Upon realization that the claimed invention is not directed to an abstract idea per se, but rather a practical application of mathematical relationships to perform data classification, it should be clear that the claimed invention defines statutory subject matter under section 101.*

To constitutionally interpret the word "method" or "process", the Supreme Court has held that: *** The process **requires** that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence." (Emphasis added) DIAMOND v. DIEHR, 450 U.S. 175, 184 (1981) (quoting Cochrane v. Deener, 94 U.S. 780, 787 -788 (1877).)

Applicant discloses no "certain substances" that have been "transformed or reduced" in that applicant's claims disclose no manipulation of specific data representing physical objects or activities (pre-computer activity), nor do they disclose any specific independent physical acts being performed by the invention (post-computer activity). Applicant only discloses a method comprising defining a linear programming formulation of a support vector machine classifier ... selecting an input set for the support vector machine classifier based on the solution.

Such a method cannot satisfy Supreme Court requirements for a "method".

On this basis, Applicant has not shifted his burden of showing that his claims are statutory and Examiner's rejection of those claims stands.

- <u>Argument 4</u>: *Notably, the Examiner has identified a number of U.S. patents with claims relating to data classification. Two examples are U.S. Patent Nos. 6,112,195 and 6,134,344, both to Burges, which include claims relating to the use of data classifiers such as support vector machines. Claim 1 of the '195 patent, for example, recites incorporating a local invariance in such a way that a resulting dimension of each feature vector in a kernel-based classifier system (e.g., a support vector machine) is fixed and that the dimension is equal to the dimension of input data minus the number of degrees of freedom in the local invariance, wherein the input data is of dimension N and the provided data is of dimension M, where M>N. The invention claimed in the '195 patent to Burges certainly makes use of mathematical relationships. Like the invention claimed by Applicant, however, the Burges invention is directed to the practical application of such relationships to a data classifier.*

All patents issued stand on their own merits and are not subject matter for justification of

allowance in other applications. The justification for allowance of applications is found

in current statuses, appropriate case law and USPTO policy that follows current statuses.

- <u>Argument 5</u>: *In addition, Applicant notes that new claims 46-54 recite additional features of the claimed invention. For example, new claims 46, 49, and 52 specify use of the claimed invention by application of a support vector machine classifier to classify data relating to fraud detection, credit evaluation, gene expression, intrusion detection, medical diagnosis or medical prognosis. In addition, claims 47, 48, 50, 51, 53 and 54 specify use of the claimed invention by application of a support vector machine classifier to classify data relating to multiple myeloma. Multiple myeloma is often fatal. Accordingly, accurate classification of data relating to multiple myeloma is important for diagnosis and treatment of patients suffering from the disease. New claims 55-57 define a support vector machine classification system comprising a data storage medium storing input data for classification, a support vector machine classifier, and a selection module. The support vector machine classifier classifies the input data into a first set of data and a second set of data based on a set of input features. The selection module produces a reduced set of input features for the support vector machine classifier based on a minimization of an exterior penalty function of a dual of a linear programming formulation of the linear support vector machine classifier for a finite value of a penalty parameter. Clearly, the support vector machine classification system of claims 55-57 is used for a practical application that provides a useful, concrete and tangible result.*

Applicants are reminded that to satisfy section 101 requirements, the claims must be for a

practical application of the §101 judicial exception, which can be identified in various

ways: either the claimed invention "transforms" an article or physical object to a different

state or thing, or the claimed invention otherwise produces a useful, concrete, and

tangible result. Applicants cited the practical application as "data classification" with no

specific data representing physical objects or activities that are being transformed.

Furthermore, applicants cited *a support vector machine classifier to classify data relating*

to fraud detection, credit evaluation, gene expression, intrusion detection, medical

diagnosis or medical prognosis. These are just field of use with no specific practical

application.

2.   Rejection of claims 1-57 under 35 U.S.C. § 102(b):

- Argument 1: *Fung does not disclose or suggest defining a linear programming formulation of a support vector machine classifier, solving an exterior penalty function of a dual of the linear programming formulation to produce a solution to the support vector machine classifier, and selecting an input set for the support vector machine classifier based on the solution, as set forth in claims 1-15.*

Fung teaches a linear programming formulation of a support vector machine classifier

(page 3, paragraph 2, page 12), solving an exterior penalty function of a dual of the linear

programming formulation to produce a solution to the support vector machine classifier

(page 5), and selecting an input set for the support vector machine classifier based on the

solution (page 5).

- Argument 2: *Fung does not suggest a computer-readable medium storing instructions to cause a processor to perform such functions, as set forth in claims 31-45.*

Fung does suggest a computer-readable medium storing instructions to cause a processor

to perform such functions, as set forth in claims 31-45 (abstract).

- Argument 3: *Fung lacks any teaching that would have suggested a classification system comprising a processor that applies a linear programming formulation of a support vector machine classifier to classify data based on an input set, and an input module that generates the input set based on a solution of an exterior penalty function of a dual of the linear programming formulation, as defined by claims 16-30.*

Fung teaches a classification system comprising a processor that applied a linear

programming formulation of a support vector machine classifier (page 3, paragraph 2,

page 12) to classify data based on an input set, and an input module that generates the

input set based on a solution of an exterior penalty function of a dual of the linear

programming formulation , as defined by claims 16-30 (page 5).

- Argument 4: *Fung does not disclose the use of a linear programming formulation of a support vector machine classifier.*

Fung discloses the use of a linear programming formulation of a support vector machine

classifier (page 3, paragraph 2, page 12).

CONCLUSION

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

CORRESPONDENCE INFORMATION

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Mai T. Tran whose telephone number is (571) 272-4238. The

examiner can normally be reached on M-F 9:00am-- 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, David Vincent can be reached on 571-272-3080. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAVID VINCENT
SUPERVISORY PATENT EXAMINER